



### Description

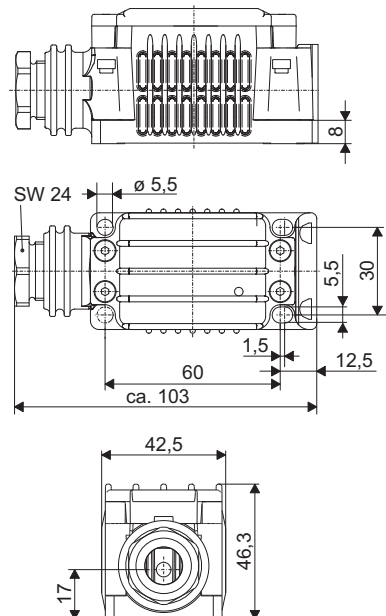
Position switches are used wherever movable parts on machinery and systems have to be positioned, controlled and monitored. They control and facilitate signal transmission in switching gear or function as switches in regulating and control devices.

The flameproof encapsulated BARTEC position switches can be used in hazardous (potentially explosive areas in Zones 1 and 2 in accordance with the certified explosion subgroups IIA, IIB and IIC and the temperature class T6 and in Zones 21 and 22 according to the certified maximum surface temperature.

### NOTE

See page 4 for the designations of the components in the position switch.

### Dimensions in mm Enclosure without actuators



### Position switch without actuator

#### Explosion protection

##### Ex protection type

- II 2G Ex d IIC T6
- II 2D Ex tD A21 IP66 T80 °C
- CE 0044

##### Certification

PTB 09 ATEX 1048 X

##### Ambient temperature

- Operation: -20 °C to +60 °C
- Storage, transport: -20 °C to +80 °C

##### Approved for zones

1/21 and 2/22

#### Technical data

##### Protection class

IP 66 (IEC 60529)

##### Weight

ca. 160 g

##### Mechanical switching unit

###### Rated insulation voltage

400 V

###### Rated operating voltage/current

- AC 15:400 V/4 A
- AC 15: 24V and 240 V/6 A
- DC 13: 24V/3 A
- DC 13:110 V/0.8 A
- DC 13:220 V/0.3 A

###### Rated impulse strength

4 kV AC

###### Switching rate

up to 6000/h depending on type

###### Service life

electrical: depending on load  
mechanical: max. 10<sup>6</sup> switching cycles (depending on actuation angle/speed)

##### Electronic switching unit

###### Rated voltage

up to 30 V DC

###### Rated operating voltage/current

- DC 12 V/0.015 A
- DC 24V/0.018 A
- DC 30 V/0.019 A

##### Tightening torques

- Lid screws: max. 0.9 Nm
- Pressure screw: 5 Nm

##### Enclosure /plunger material

Injection moulding made of thermoplastic

### Actuator

#### Technical data

##### Weight

depends on the model

##### Tightening torque

Actuator screws 0.9 Nm

##### Further technical information

Types of contact, contact assignments and switching examples: see page 5

### Cable entry

#### Technical data

##### Pressure screw

M 20 x 1.5

##### Cable diameter 5 to 8.4 mm

###### Washer:

- Outside diameter 18.3 mm
- Inside diameter 8.7 mm
- Thickness 1 mm

###### Sealing ring:

- (fitted, without marking)
- Outside diameter 18.5 mm
- Inside diameter: 8.4 mm
- Height: 13 mm

##### Cable diameter 8 to 12 mm

###### Washer:

- Outside diameter 18.3 mm
- Inside diameter of 12.2 mm
- Thickness 1 mm

###### Sealing ring:

- (with marking "20S")
- Outside diameter 18.5 mm
- Inside diameter of 11.7 mm
- Height 13 mm

### NOTE

For a picture of the cable entry see also the assembly illustrations on page 4.

## Safety Instructions

Incorrect installation can cause malfunctioning and the loss of protection against explosions.

The position switch may be connected and assembled only by qualified personnel who are authorised and trained to assemble electrical devices in hazardous (potentially explosive) areas.

The position switch with actuation may never be operated without the actuator. Only use sealing rings and washers that suit the conductor diameter. Utilisation without a sealing ring / washer or with an incorrect sealing ring / washer will lead to the loss of protection class and explosion -proofness. The fully installed position switches must close tightly (observing torques).

Do not open position switches if the atmosphere is explosive. Always disconnect the actuator from voltage before assembly /disassembly.

Utilisation in areas other than those specified or the alteration of the product by anyone other than the manufacturer will exempt BARTEC from liability for defects or from any further liability.

The generally applicable statutory rules and other binding directives relating to workplace safety, accident prevention and environmental protection must be adhered to.

The position switch may be used only if it is clean and free of any damage. The position switch may not be used as a mechanical stop.

## Standards conformed to

EN 60079-0:2006  
EN 60079-1:2007  
EN 61241-0:2006  
EN 61241-1:2004  
EN 60947-5-1:2004  
EN 61000-4-2:2001  
EN 61000-4-3:2001  
EN 61000-4-4:2002  
EN 61000-4-5:2001  
EN 61000-4-6:2001

## Marking

Particularly important points in these instructions are marked with a symbol:

### DANGER

*Non-observance leads to death or serious physical injury. The necessary safety measures must be implemented.*

### CAUTION

*Warning of damage to property and financial and penal disadvantages (e.g. loss of guarantee rights, liability claims etc.).*

### ATTENTION

*Important instructions and information on preventing disadvantageous behaviour.*

### NOTE

*Important instructions and information on effective, economical and environmentally compatible handling.*

## Assembly and Commissioning

### ATTENTION

*Only authorised and qualified personnel may do any of the assembly, disassembly, installation and commissioning work.*

### CAUTION

The relevant installation and operating regulations must be observed when setting up or operating explosion-proof electric systems.

### Assembly/Disassembly

#### ATTENTION

*If the position switches / actuators are stored in a cold environment, condensation may occur in the site of installation. Only mount components without condensation.*

*Dust deposits exceeding 5 mm must be removed.*

*At least two 5-mm-diameter screws must be used for mounting the position switch.*

A strain relief device (e.g. SILVYN-RKS cable clamp from Lapp or equivalent) must be fitted approx 50 mm after the screwed connection. Observe the minimum bending radius for the cable.

### NOTE

*The assembly steps are illustrated on page 4.*

## Installation

### DANGER

*The supply cable must be selected so that it satisfies the thermal and mechanical requirements in the area of use. It is important not to damage the core insulation during installation.*

*Only the conductors listed in the table on page 3 may be used.*

*When shielded conductors are used, the sheathing must be cut off flush with the outer jacket.*

*When connecting multi-wire or fine-stranded conductors, prepare the conductor ends first.*

Supply cable, cross-section:

0.75 - 2.5 mm<sup>2</sup> (one-wire)

0.75 - 1.5 mm<sup>2</sup> (fine-wired, wire end ferrule)

### DANGER

*Always use the sealing ring and washer included in the scope of supply that suit the conductor diameter.*

*Only use parts included in the scope of supply. Never use cable entries or parts from another manufacturer.*

The max. torque for the lid fixing screws is 0.9 Nm.

## Commissioning

Before commissioning check that:

- the device has been installed in compliance with regulations
- the device is not damaged
- there is no foreign matter in the device
- the junction box is clean
- the connection has been established properly
- the cable has been run in properly
- all screws are tightened securely
- the cable entry, sealing ring and sealings have been fitted correctly
- the flameproof enclosure is not damaged

## Switching point setting

### CAUTION

*Do not open position switches in an explosive atmosphere.*

The switching point in the electronic switching unit can be set in the range from 0.5 mm to 5.5 mm:

- Loosen the lid screws and take off the lid
- Move the actuator to the switching position
- Press the set button on the switching unit for 1 s
- LED must flash with a high frequency
- Put on the lid, tighten the lid screws

## Operation

### DANGER

The position switch may be operated only within the technical limits that apply to it (see the Explosion Protection and Technical Data sections).

## Maintenance

The operator of the position switch must keep it in an orderly condition, operate it correctly, monitor it and clean it regularly. The enclosure, sealings and cable entry must be checked regularly for cracks and damage.

### NOTE

Dirty enclosures/actuators can be cleaned with dry and clean compressed air.

## Fault clearance

### DANGER

If the conductor to the position switch is replaced, a new sealing ring and a new washer must be inserted too.

Always use a sealing ring and washer that suit the conductor diameter.

The position switch is defective if the switching unit does not perform the switching function or the actuator does not activate the switching unit any longer. Defective position switches cannot be repaired; they must be replaced.

Only original parts (e.g. sealings, sealing rings, washers, pressure screw) may be used as replacements.

Defective actuators can be taken off the position switches and replaced by functioning actuators of the same type.

### DANGER

A new sealing must be inserted whenever the actuator is replaced.

## Accessories, Spare Parts

on request

## Disposal

The components in the position switch and the actuator contain metal and plastic parts. For that reason the statutory requirements for electronic scrap must be adhered to when disposing of them (e.g. disposal by an approved disposal company).

## Service Address

BARTEC GmbH  
Max-Eyth-Straße 16  
D-97980 Bad Mergentheim  
Tel.: +49 7931 597-0  
Fax: +49 7931 597-119

## Supply cables to be used

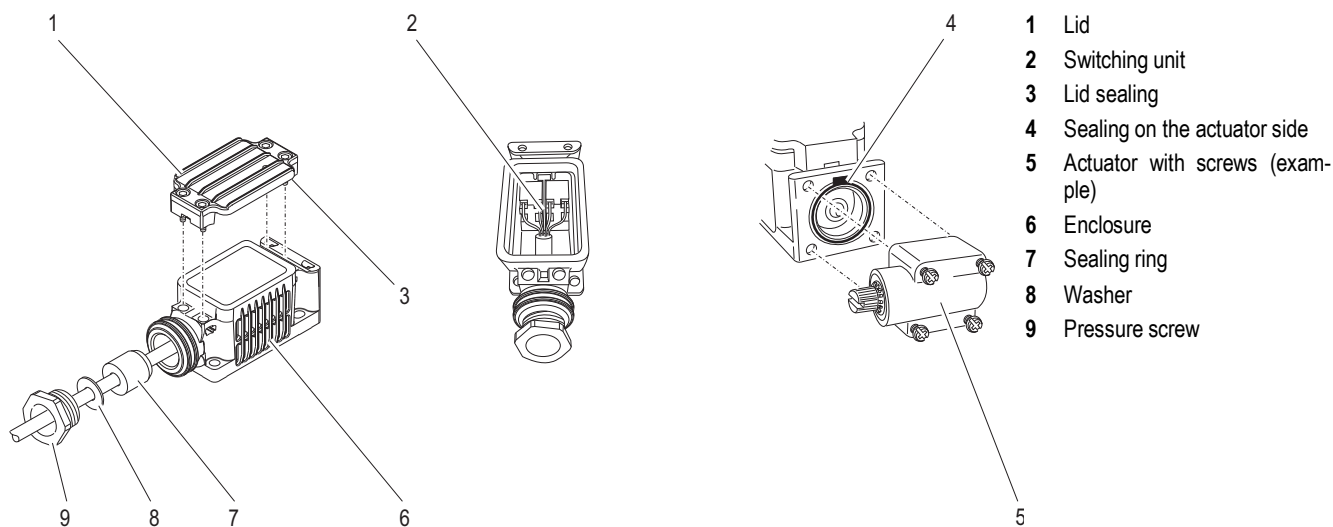
### DANGER

Only the following supply cables may be used. Equivalent conductors (i.e. from other manufacturers) are permitted.

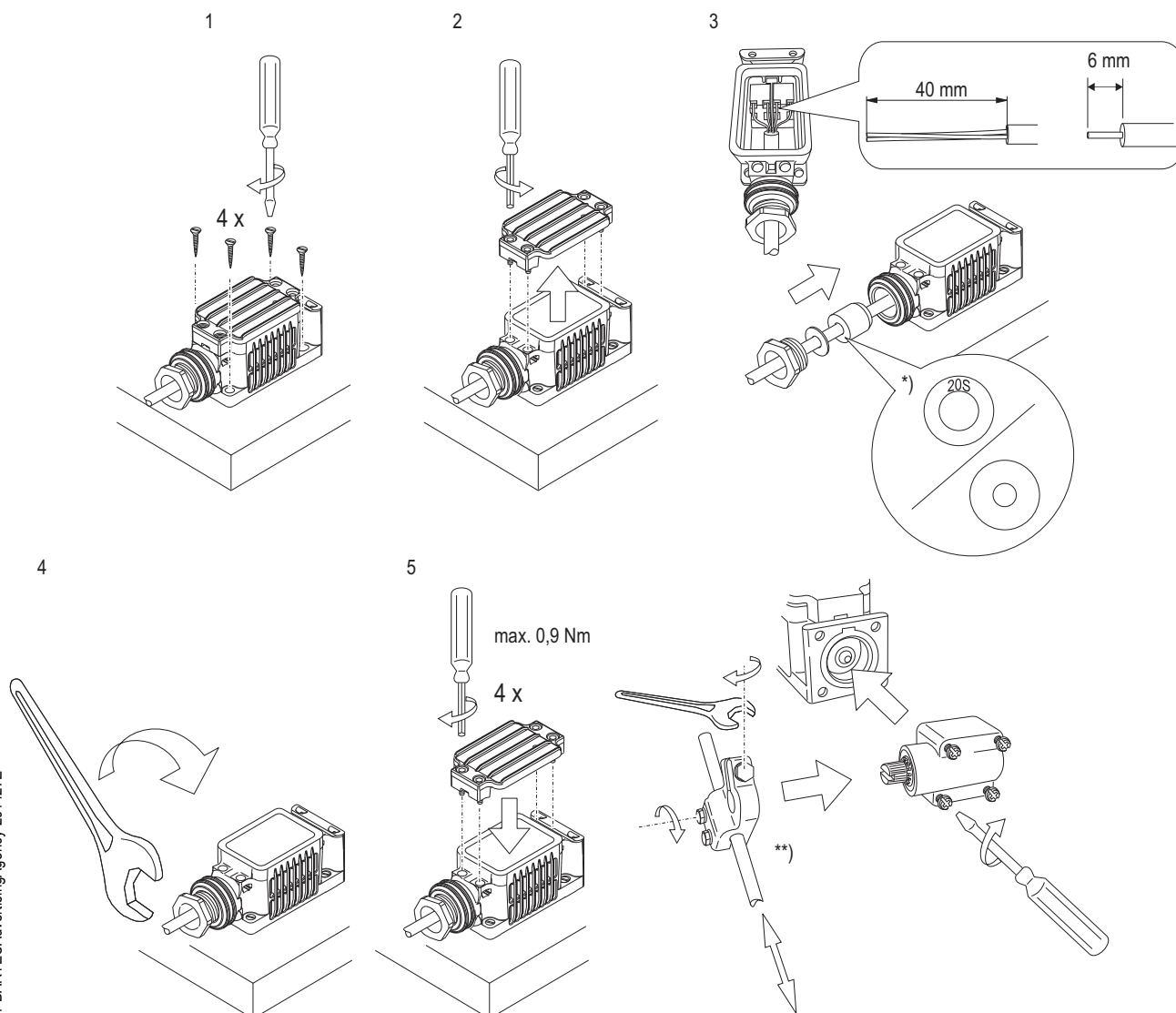
Cable	Max. ambient temperatur	Min. conductor cross-section
H07RN-F / A07RN-F	40 °C	0.75 mm <sup>2</sup>
H05RN-F / A05RN-F	40 °C	0.75 mm <sup>2</sup>
H05VV-F / A05VV-F	40 °C	0.75 mm <sup>2</sup>
Ölflex® (shielded also)	40 °C	0.75 mm <sup>2</sup>
Unitronic-LiyCY	40 °C	0.75 mm <sup>2</sup>
H05VV-F / A05VV-F	60 °C	1.5 mm <sup>2</sup>
Ölflex® (shielded also)	60 °C	1.5 mm <sup>2</sup>
NSSHöu	60 °C	1 mm <sup>2</sup>
Ozoflex plus H07RN-F	60 °C	1 mm <sup>2</sup>
H05GG-F	60 °C	1 mm <sup>2</sup>
Radox (shielded also)	60 °C	1 mm <sup>2</sup>

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### Components in the Position Switch



### Assembly

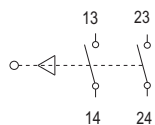


### Explanations

- \*) The sealing ring for large conductor diameters is marked "20S".
- \*\*) Only when changing or turning the actuator. Adjustment and insertion depend on the actuator being used.

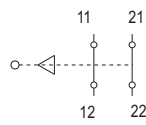
## Types of Contact, Contact Assignments and Switching Examples

### Type 07-2931-1122/\*\*



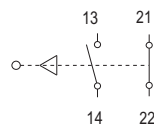
2 N/O contacts  
Slow-action contact element

### Type 07-2931-1166/\*\*



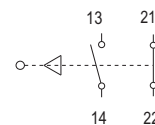
2 Positive opening operation contacts  
Slow-action contact element

### Type 07-2931-1126/\*\*



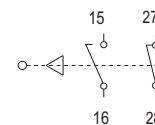
1 N/O contact / 1 positive opening operation contact  
Slow-action contact element

### Type 07-2931-1326/\*\*



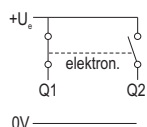
1 N/O contact / 1 positive opening operation contact  
Snap-action contact element

### Type 07-2931-1226/\*\*



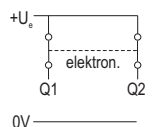
1 N/O contact / 1 positive opening operation contact  
Overlapping slow-action contact element

### Type 07-2931-1421/\*\*



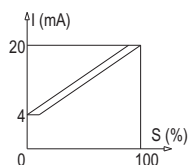
1 N/O contact / 1 N/C contact  
Operating position electronically adjustable

### Type 07-2931-1411/\*\*



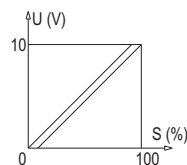
2 N/C contacts  
Operating position electronically adjustable

### Type 07-2931-1500/\*\*



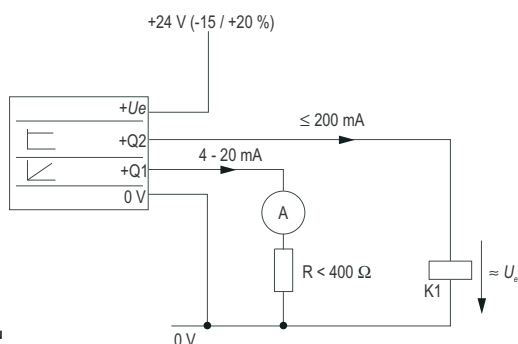
analog electronic position switch 4 - 20 mA

### Type 07-2931-1600/\*\*

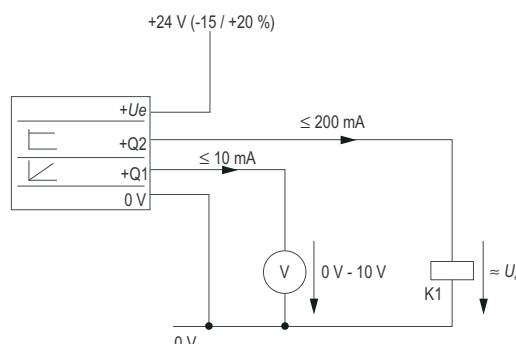


analog electronic position switch 0 - 10 V

### Switching example for 07-2931-1500/\*\*



### Switching example for 07-2931-1600/\*\*

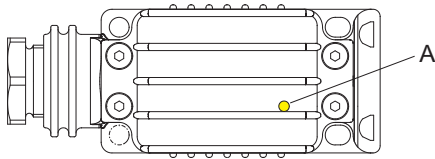


## Explanations

The diagram labelling is identical to the connection labelling in the position switch.

### LED Mode of Operation

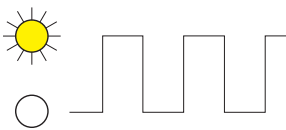
A lamp tube for the LED display for the switching unit (A) is fitted into the lid. This display shows the operating status of the switching unit.



#### Types 07-2931-1411/\*\* and 07-2931-1421/\*\*

The electronic position switches have a self-test function. The Q1 and Q2 outputs are constantly monitored for overload, short circuit against 0 V and short circuit against +U<sub>e</sub>. The LED display in the lid indicates the operating status as well as the plunger actuation and set button:

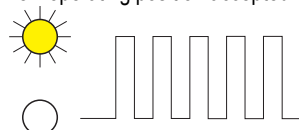
Plunger not actuated



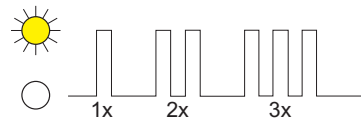
Plunger actuated



Set button actuated,  
new operating position accepted



Fault in the device



#### Types 07-2931-1500/\*\* and 07-2931-1600/\*\*

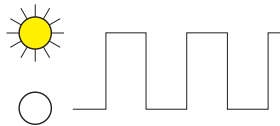
The electronic position switches have a self-test function. The Q1 and Q2 outputs are constantly monitored for overload, short circuit against 0 V and short circuit against +U<sub>e</sub>. The LED display in the lid indicates the operating status:

##### Type 07-2931-1500/\*\*

Normal case:  
Q1 = 4 - 20 mA  
Q2 ≈ U<sub>e</sub>



Fault:  
Q1 = 0 mA  
Q2 = 0 V

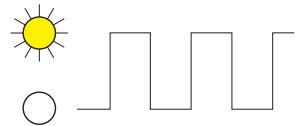


##### Type 07-2931-1600/\*\*

Normal case:  
Q1 = 0 - 10 V  
Q2 ≈ U<sub>e</sub>



Fault:  
Q1 = 0 V  
Q2 = 0 V





Erklärung der Konformität  
Declaration of Conformity  
Attestation de conformité

N° 01-2930-7C0001

**BARTEC**

BARTEC GmbH  
Max-Eyth-Straße 16  
97980 Bad Mergentheim  
Germany



Wir	We	Nous
<b>BARTEC GmbH,</b>		
erklären in alleiniger Verantwortung, dass das Produkt	declare under our sole responsibility that the product	attestons sous notre seule responsabilité que le produit
<b>Positionsschalter</b>	<b>Position switch</b>	<b>Interrupter de position</b>

#### Typ 07-293\*-1\*\*\*/\*\*

auf das sich diese Erklärung bezieht den Anforderungen der folgenden Richtlinien (RL) entspricht	to which this declaration relates is in accordance with the provision of the following directives (D)	se référant à cette attestation correspond aux dispositions des directives (D) suivantes
<b>ATEX-Richtlinie 94/9/EG</b>	<b>ATEX-Directive 94/9/EC</b>	<b>ATEX-Directive 94/9/CE</b>
<b>EMV-Richtlinie 2004/108/EG</b>	<b>EMC-Directive 2004/108/EC</b>	<b>CEM-Directive 2004/108/CE</b>
<b>Niederspannungs-Richtlinie 2006/95/EG</b>	<b>Low voltage Directive 2006/95/EC</b>	<b>Basse tension Directive 2006/95/CE</b>
und mit folgenden Normen oder normativen Dokumenten übereinstimmt	and is in conformity with the following standards or other normative documents	et est conforme aux normes ou documents normatifs ci-dessous
<b>EN 60079-0:2006</b>	<b>EN 61000-4-2 :2001</b>	<b>EN 61000-4-5 :2001</b>
<b>EN 60079-1 :2007</b>	<b>EN 61000-4-3 :2001</b>	<b>EN 61000-4-6 :2001</b>
<b>EN 61241-0:2006</b>	<b>EN 61000-4-4 :2002</b>	<b>EN 60947-5-1 :2004</b>
<b>EN 61241-1 :2004</b>		

<b>Kennzeichnung</b>	<b>Marking</b>	<b>Marquage</b>
<b>II 2 G Ex d IIC T6</b>		
<b>II 2 D Ex tD A21 IP66 T80 °C</b>		
<b>Verfahren der EG-Baumusterprüfung</b>	<b>Procedure of EC-Type Examination</b>	<b>Procédure d'examen CE de type</b>
<b>PTB 09 ATEX 1048 X</b>		
<b>CE 0044</b>		

Bad Mergentheim, den 22.01.2010

ppa: Ewald Warmuth

Geschäftsleitung / General Manager